

Debian package manager

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Install Software

- 先別管package了, 你有聽過重灌嗎?
- Chrome/Firefox, Office, pietty, Notepad ++, PCMan, LOL, ...
- Installing many software is annoying.

Install software by source code

- Download source and compile
 - `wget .../xxx-###.tar`
 - Decompress, then look up how to compile
 - `./configure`
 - `make`
 - `make install`
- It takes some times.

Better way to install and manage

- Download binary
- Setup script
- Dependencies
 - Program A needs library/program B to work
 - LOL_TW requires 競時通
 - Gamania games requires beanfun!
- Version
 - Upgrade to new release version easily

Package Manager

- Package
 - An archive
 - Binary
 - Control Information
- Operation
 - Install
 - Remove
 - Query
 - Upgrade

Package Manager

Base	Package	Tool	Front end
dpkg	.deb	apt	apt-get apt-cache aptitude
rpm	.rpm	yum	rpm yum

Package Repository

- Package storage server
 - Packages of several versions
 - Index file
 - Maintained by distributions
- /etc/apt/source.list
- [Homework Q1]
 - Show how to change package source mirror.
 - Which command gets new index file?

Type of Packages

- Binary package
 - Includes program binary
- Meta package
 - Depends on other packages only
 - apache2 -> apache2.2-common
- Virtual package
 - Not really exists
 - Other packages “provide” virtual package
 - c-compiler

Useful commands

- apt-get
 - install, remove, upgrade, ...
- apt-cache
 - show, search, ...
- aptitude
 - almost all commands of apt-get/apt-cache

Command: search

- aptitude search ^apache2
 - Search pattern can be regular expressions
 - Other patterns support: [reference](#)
- apt-cache search apache2
 - Also search in description

Flags

```
lilian@debian: ~ [65x25]
連線(C) 編輯(E) 檢視(V) 視窗(W) 選項(O) 說明(H)
lilian@debian:~$ aptitude search ^apache2
i apache2 - Apache HTTP Server metapackage
p apache2-dbg - Apache debugging symbols
v apache2-dev -
p apache2-doc - Apache HTTP Server documentation
v apache2-mpm -
p apache2-mpm-event - Apache HTTP Server - event driven
p apache2-mpm-itk - multiuser MPM for Apache 2.2
i A apache2-mpm-prefork - Apache HTTP Server - traditional n
p apache2-mpm-worker - Apache HTTP Server - high speed th
p apache2-prefork-dev - Apache development headers - non-t
p apache2-suexec - Standard suexec program for Apache
p apache2-suexec-custom - Configurable suexec program for Ap
p apache2-threaded-dev - Apache development headers - threa
i A apache2-utils - utility programs for webservers
i A apache2.2-bin - Apache HTTP Server common binary f
i A apache2.2-common - Apache HTTP Server common files
```

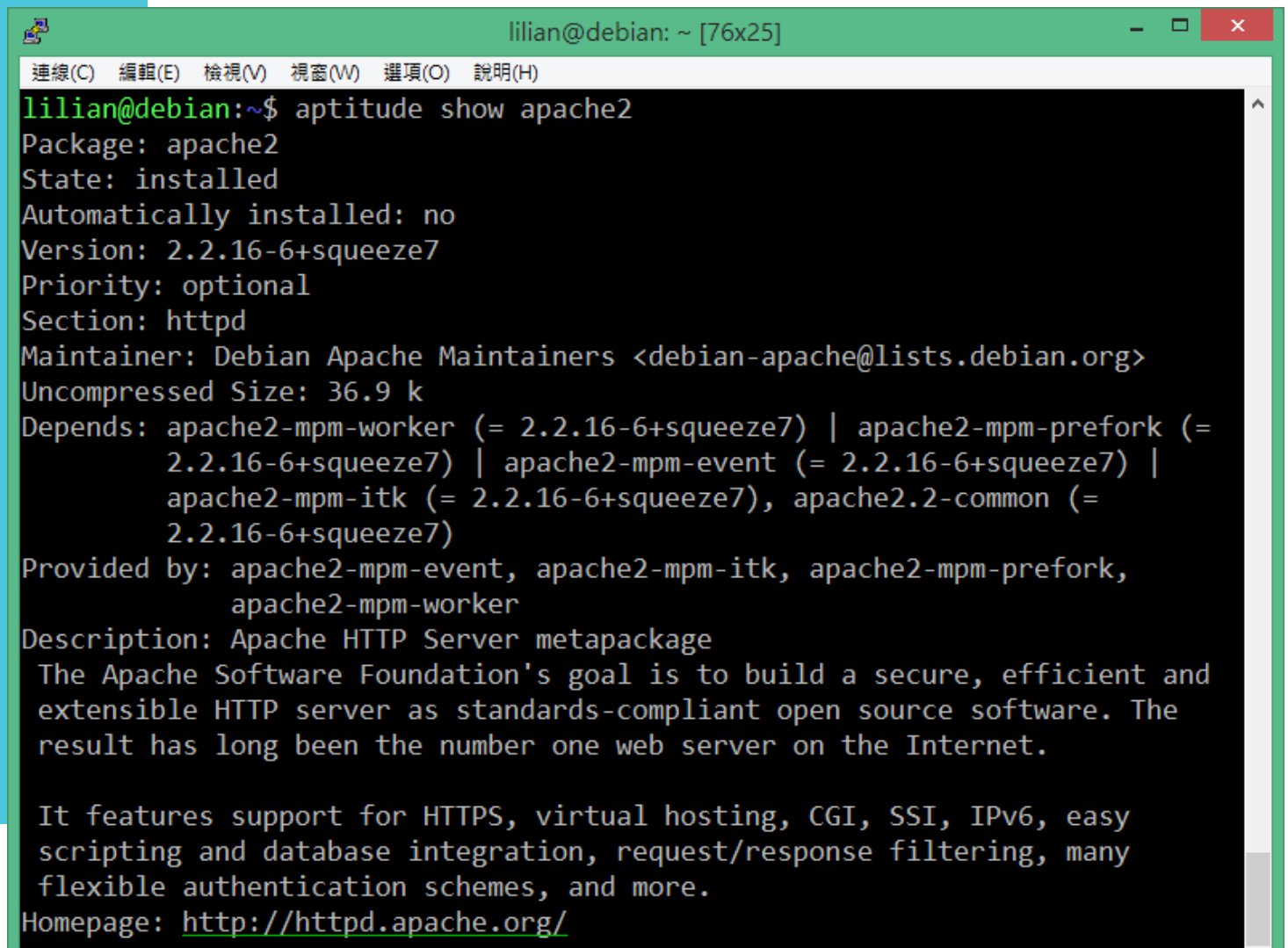
Flags

- Current state flag
- Action flag
- Automatic flag

State flag	description
i	installed
c	config, removed
p	purge
v	virtual
B	broken
u	unpacked
C	half-configured
H	half-installed

Command: show

- aptitude show apache2
 - List the information of package apache2



```
lilian@debian: ~ [76x25]
連線(C) 編輯(E) 檢視(V) 視窗(W) 選項(O) 說明(H)
lilian@debian:~$ aptitude show apache2
Package: apache2
State: installed
Automatically installed: no
Version: 2.2.16-6+squeeze7
Priority: optional
Section: httpd
Maintainer: Debian Apache Maintainers <debian-apache@lists.debian.org>
Uncompressed Size: 36.9 k
Depends: apache2-mpm-worker (= 2.2.16-6+squeeze7) | apache2-mpm-prefork (=
        2.2.16-6+squeeze7) | apache2-mpm-event (= 2.2.16-6+squeeze7) |
        apache2-mpm-itk (= 2.2.16-6+squeeze7), apache2.2-common (=
        2.2.16-6+squeeze7)
Provided by: apache2-mpm-event, apache2-mpm-itk, apache2-mpm-prefork,
        apache2-mpm-worker
Description: Apache HTTP Server metapackage
 The Apache Software Foundation's goal is to build a secure, efficient and
 extensible HTTP server as standards-compliant open source software. The
 result has long been the number one web server on the Internet.

 It features support for HTTPS, virtual hosting, CGI, SSI, IPv6, easy
 scripting and database integration, request/response filtering, many
 flexible authentication schemes, and more.
Homepage: http://httpd.apache.org/
```

Package information

- Package
 - name
- State
 - installed, not installed, ...
- Automatically
 - Manage automatically
 - If set, remove package when not needed
- Version
 - [epoch:]upstream_version[-debian_revision]
 - 2.2.16-6+squeeze7
 - reference

Package information

- Priority
 - required
 - important
 - standard
 - optional
 - extra
 - reference
- Maintainer
- Description
- Architecture

Package information

- Dependencies
 - depends
 - recommends
 - suggests
 - conflicts
 - replaces
 - breaks
 - provides
 - Reference

Command:
install
remove
purge

- `apt-get install apache2`
 - Install apache2 package
- `apt-get remove apache2`
 - Uninstall apache2 package
 - Config file remains
- `apt-get purge apache2`
 - Uninstall apache2 package
 - Delete config file
 - Is configure file removed?

Command: upgrade dist-upgrade

- aptitude upgrade
 - upgrade current packages
 - Does not upgrade some packages if updating these cause some others packages to be installed/removed.
- aptitude dist-upgrade
 - Upgrade all current packages
 - If meets conflict, it will try to generate solutions to satisfy new dependency.

Practice

- Search a database server
- Install it
- Remove it

Build a simple meta-package

- package/DEBIAN/control
 - You can reference some field
aptitude show xxx outputs
- dpkg-deb -b package
- [Homework Q2]
 - Build a meta-package
 - Name: nasa
 - Should always install mysql-server(>= 5.0)
 - Should always install apache2(>=2.2)
 - Should not install when lighttpd installed

Build a binary package

- Tutorial:
<http://www.debian.org/doc/manuals/maint-guide/first.en.html>
- Install packages needed
 - build-essential
 - dpkg-dev
 - debhelper
 - CDBS
 - dh-make
 - lintian: check if package has error

Build a binary package

1. Download source code
2. Unpack
3. dh_make
4. Modify control file
5. Add path if needed
6. Build package
 - dpkg-buildpackage
 - [Homework Q3] (optional)
 - Build a package of “Omnitty”

Homework

- There are 3 questions, check HW8.pdf
 1. Change package source mirror
 2. Build nasa-hw meta package
 3. Build omnitty package
 - Optional question